

Eyes on the prize: reflections on the impact of the evolving digital ecology on the librarian as expert intermediary and knowledge coach, 1969–2009*

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Objective: The 2009 Janet Doe Lecture reflects on the continuing value and increasing return on investment of librarian-mediated services in the constantly evolving digital ecology and complex knowledge environment of the health sciences.

Setting: The interrelationship of knowledge, decision making based on knowledge, technology used to access and retrieve knowledge, and the important linkage roles of expert librarian intermediaries is examined.

Methodology: Professional experiences from 1969 to 2009, occurring during a time of unprecedented changes in the digital ecology of librarianship, are the base on which the evolving role and value of librarians as knowledge coaches and expert intermediaries are examined.

Conclusion: Librarian-mediated services linking knowledge and critical decision making in health care have become more valuable than ever as technology continues to reshape an increasingly complex knowledge environment.

INTRODUCTION

I am honored to have been selected as the Janet Doe Lecturer for 2009. I offer a sincere thank you to the jury and to the nominators. Presenting the Doe lecture is something that even in my wildest dreams I never thought would occur, especially in the fall of 1969 when I entered the Graduate Library School of the University of Chicago.

As with other Doe lecturers, I encountered some anxiety in deciding on an area that I wanted to share with you in this lecture. Other lecturers have reported the "terror" of receiving the letter announcing that they had been chosen as the Doe lecturer. As some of you may recall, David Bishop's response to learning that he had been chosen as the Doe lecturer was that "he'd joined the ranks of the dinosaurs" [1]. David's reaction was in the context of reading James Michener's novel *Centennial*, in which Michener characterizes the dinosaurs, in their environmental adaptations, as one of the most successful animal inventions nature had provided. David suggested that Michener's description of the dinosaurs might not be an exact description of the Doe lecturers, "but it will suffice" [1].

Lucretia W. McClure, AHIP, FMLA, best captured both the anxiety of being selected a Doe lecturer and the joy of finally settling on a topic in her 1985 lecture when she said that the anxiety is eased when a satisfactory topic is selected and "The joy comes from delving into the subject and discovering the many ideas and writings of many thoughtful authors, and this experience far outweighs the anxiety" [2].

Highlights

- The importance of librarian-mediated services is illustrated through descriptions of early research on selective dissemination of information services, the first MEDLINE class taught in Hawaii using the ARPANET forerunner of the Internet, and an early example of informationist services in a research environment.

Implications

- In an age of information overload and dross, expert intermediaries provide an essential function for the health care team by allowing consumers of knowledge to focus on the wise interpretation and use of knowledge for critical decision making, rather than spend unproductive time on its acquisition, access, and retrieval.

It wasn't until January 2009 that my lecture topic started to gel. That month, with the 2008 presidential election having concluded, the television news shows to which I am addicted were turning to the upcoming inauguration of President Barack Obama. On January 11, 2009, I happened to be watching the broadcast of *Face the Nation* with Bob Shieffer. Shieffer was reminiscing about the fact that Obama's swearing-in would mark Shieffer's twelfth inauguration, and he noted that "Like all inaugurals, it will be keyed to the future, about hope and the expectations to come" [3]. Shieffer was philosophical about the January Obama inauguration and paraphrased Marcel Proust's notion that an unremarkable object such as a tree, or rock, or an experience can unlock a memory long forgotten. For me, this somewhat unremarkable experience

* The Janet Doe Lecture on the history or philosophy of medical librarianship, presented at MLA '09, the 109th Annual Meeting of the Medical Library Association; Honolulu, HI; May 18, 2009; Thomas G. Basler, FMLA, the 2008 Janet Doe lecturer, gave the introduction.

helped shape this lecture and spurred me to delve into the events and experiences that have helped shape my journey in our profession and to rekindle a sense of hope and expectation for our profession.

I am neither a historian nor a philosopher, and hence my lecture title includes the word “reflections.” As Nina W. Matheson, AHIP, FMLA, stated in her 1994 lecture, “Every Doe lecturer...has disclaimed professional qualifications for writing history or philosophy. Yet each has struggled to...live up to the honor of the lectureship. ...All have written about what they hold nearest and dearest to their professional hearts, seeking to inform, to provide insight, to inspire, and even to entertain” [4].

THE SCIENCE AND ART OF LINKING INFORMATION AND KNOWLEDGE TO IMPORTANT DECISIONS

What I hold nearest and dearest to my professional heart is the power and continuing relevance of librarian-mediated services—those services provided by our wise medical librarian knowledge coaches, who help to ensure the individual success of our employees, students, and patients, as well as help to ensure the collective success of the institutions we serve. They are practicing the science and art of linking information and knowledge to the important clinical, scientific, and business decisions that must be made.

The notion of keeping our eyes on a prize reflected in the title of this lecture is not simply the promotion of a profession we love. The ultimate prize is the success of the individuals and institutions we serve, for it is our service to individuals, institutions, and humanity that fuels our professional passion.

The continuously evolving digital ecology provides ever-more powerful technology incorporating speed, comprehensiveness, collaboration, and artificial intelligence, but it is the expert librarian who makes sense out of competing systems, resources, and priorities and provides an essential link to information, knowledge, and human resources for decision making.

THE “WEALTH OF DROSS”: REFRAMED AS OPPORTUNITY

Lucretia McClure used the phrase “wealth of dross” in her 1985 Doe lecture [2]. “Dross” is defined as waste or foreign matter or that which is base, trivial, or inferior. In the context of information, it might be a false drop, or peripherally relevant retrieval, or information that is not from a trusted or authoritative source. She asked, “How do we steer them through this ‘wealth of dross’ to the answer?” [2].

Part of the information overload that is apparent today in the health professions is not solely the information explosion, but it is the wealth of dross and the need to filter and sift through mountains of information to find the pearls of information and knowledge that our users seek—to make sound clinical, business, scientific, and personal health care

decisions. As medical librarians, we know the path to knowledge and wisdom is not always a quick Google search, although the powerful search engine will definitely help in the journey to the truth.

My reflections today are in a sense a continuation of those begun by Lucretia nearly twenty-five years ago on the historical development of reference and information services. In ways not dissimilar to 1985, the evolving digital ecology of our world has brought about incredible and positive sea changes in the technology used by and affecting our profession. But we are also awash in a glut of information and a wealth of dross, or what one columnist in the *Washington Post* called “tons of irrelevant data and distracting fluff” [5]. To my way of thinking, powerful technology, increasing complexity in the knowledge domains, and information overload in the health professions spells opportunity and hope because we are the profession most expert at quality filtering and serving as knowledge coaches and discoverers of trusted resources in a world gone wild with a surfeit of information.

“PICTURES AT AN EXHIBITION” AND PICTURES OF A PROFESSION

My presentation strategy is to use a few stories or vignettes from my professional experience over the past forty years as a springboard to reflect on the role of librarians as expert intermediaries and knowledge coaches in our continuously evolving digital ecology.

My journey in developing this lecture reminded me of the famous Russian piano composition by Modest Mussorgsky, later orchestrated by Maurice Ravel and others, called *Pictures at an Exhibition* (or, translated from the longer Russian title, *Pictures from an Exhibition: A Remembrance of Viktor Hartmann*). You can find a detailed description of this famous work in Wikipedia [6]. The work is a piano suite of ten pieces, in which the composer introduces a promenade theme and uses it throughout the composition as a bridge between ten unique compositions that are meant to musically depict paintings at an exhibition. The exhibit was the posthumous St. Petersburg art exhibition of Mussorgsky’s recently deceased friend, Viktor Hartmann.

INCREASING RETURN ON INVESTMENT OF LIBRARIANS IN AN ATTENTION ECONOMY

My professional pictures for this lecture are filtered through the lens of experience and, of course, biased by my particular journey in our profession. I have many fewer than ten pictures. The promenade theme of my walk through the last forty years is my passion for the importance of mediated services provided by health sciences librarians, called by many names: in-depth reference, expert searching, informationist, embedded analyst, information specialist in context, clinical medical librarian. Mediated services linking knowledge and decision making at all levels of an organization have in my opinion become more

valuable than ever—an increasing return on investment (ROI)—as our digital ecology continues to change and as our information and knowledge environment becomes increasingly complex.

The enormity of change in the technological tools we have used over the past forty years—from the batch process MEDLARS searches that I provided at the beginning of my career to the latest data mining software, link resolvers, social media software, and recommender systems that are now available to discover, filter, and communicate information—is remarkable. As the profession moves in the direction of tighter integration of library resources and services in electronic medical record systems and health care practitioner workflow, one has to wonder if anything during the last forty years has remained the same, because almost everything related to knowledge discovery and access has changed dramatically.

There is one big exception. That exception is the human attention span. Through sea changes in technology, including access to billions of websites and other information, the one thing that has remained constant is the human attention span. And it is the human attention span of students, researchers, and clinicians that remains the critical component of our health sciences library world, affecting all areas of scientific scholarly communication, value-added library services, and science, technology, and medicine (STM) publishing. There is a growing body of research in this area known as the “attention economy,” including the 2001 business book, *The Attention Economy: Understanding the New Currency of Business* [7].

INFORMATION IS NOT THE SCARCE RESOURCE: HUMAN TIME AND ATTENTION IS THE SCARCE RESOURCE

Herbert A. Simon captured the concept of the attention economy most eloquently from a scholarly perspective, when he stated that information is not the scarce resource, but human time and attention are, in a 1997 article in *Annals of Operations Research*.

Today, the improvement of organizations and the information systems in them is not a matter of making more information available, but of conserving scarce human attention so that it can focus on the information that is most important and most relevant to the decisions that have to be made.

The design of any complex system must focus on the scarce factors: the bottlenecks. The scarce factor in contemporary information systems, surely including the web and the “information superhighway,” is not information; it is attention and especially human attention. [8]

In a health care attention economy, the expert intermediaries form an essential part of the health care team by allowing knowledge consumers to focus on the wise interpretation and use of knowledge for critical decision making, rather than spending unproductive time on its access and retrieval.

This specialized area of health sciences librarianship is one of the keys to our past success, and it is essential to our future ability to thrive in an increasingly complex information world replete with information overload and dross. The increasing complexity of the information and knowledge environments in which we operate is undeniable. The health sciences professions have coped with this through specializing and relying more and more on informatics and specialized services and systems. I believe our profession is well positioned to play a significant, continuing role as an important collaborator, team member, and trusted intermediary in this new world. Our experienced knowledge coaches are the marriage of librarian expertise and high-tech and soft touch personalized service. It will always be a winning combination.

Three vignettes from the author’s professional experience from 1969, the 1970s, and the 1980s help illustrate this view.

1969: research on mediated services: University of Chicago “Experimental Dissemination of Biomedical Literature” project

My introduction to the potential of librarian-mediated services from a research perspective was the “Experimental Dissemination of Biomedical Literature Project” at the University of Chicago in 1969. The research project was funded by an R01 grant from the National Library of Medicine (NLM) to investigate selective dissemination of biomedical information in collaboration with faculty members of the school of medicine. Project planning had begun in 1966 under the direction of Professor and Library School Dean Don R. Swanson. The project resulted in a number of studies carried out by graduate library school (GLS) students, often to fulfill the GLS graduation requirement of a master’s thesis. Swanson’s 1974 article in the *Library Quarterly* described the Chicago research project and cited the various publications including dissertations that resulted from the multiyear study [9].

Issued in 1970, progress report no. 4 summarized the first completed phase of data analysis. I was struck in rereading the 1970 report that some things are radically different today in our digital world, but some things have remained the same, such as the time that biomedical researchers devote to keeping up with their literature. The report introduction provided the rationale for the experimental librarian-mediated selective dissemination of journal literature in the field of biomedicine.

Since a number of studies have shown that the total literature of any subject field tends to be widely scattered, no person can expect to obtain full coverage of the literature of his field by the more conventional methods such as regularly skimming and reading portions of several journals. Hence, contact with relevant literature often tends to be sporadic, accidental, and somewhat haphazard.

The question may therefore be raised whether or not more systematic coverage by an information service could bring

to the attention of the user of such a service a higher proportion of information likely to be useful in order to make the most efficient use of his time in keeping up with the literature. [10]

The Chicago research project was undertaken to address basic questions about the operation and benefits of a more systematic mediated information service. The experimental service was established in phases and included manual scanning of multiple printed abstract and indexing (A&I) resources and tables of contents of selected journals. A second phase included machine searches of MEDLARS and CBAC in order to compare manual versus machine retrieval. One of the research questions established for the project included the question at the heart of mediated services, then and now: "To what extent can someone other than the clinician/researcher himself effectively screen the literature for him?"

On the question of effective literature filtering, the Chicago study found considerable dissimilarity between apprentice searchers' ratings of relatedness and end users' rating of relatedness, based on bibliographic citations found in A&I printed resources. By users' standards, searchers underrated some articles while they overrated others. Interestingly, the apprentice searcher performance that was far superior to all others was a GLS doctoral student who had no academic training in the biomedical sciences, but who had 5 years experience as a medical librarian. The report concluded that "It is reasonable to predict that most if not all of the same apprentices could achieve and maintain performance products above 50% if they were to have brief further 'training' designed to reinforce and clarify their understandings of users' interests" [10].

Our profession still ponders the key issues of education background and experience as they relate to effective mediated services such as informationist initiatives.

1970s: operational mediated services and Hawaii MEDLINE training via ARPANET

My second professional picture is related to MEDLINE, our most important database and something we almost take for granted now. It wasn't always so. In the late 1960s and early 1970s, while the University of Chicago was experimenting with specialized selective dissemination of information services using printed A&I resources and MEDLARS, the University of California at Los Angeles (UCLA) and other institutions were already providing specialized search services as MEDLARS search centers under an NLM contract. Later, UCLA would become a MEDLINE training center. A diminishing number of medical librarians remember when it took a minimum of three weeks to obtain a printout from NLM as a result of a batch process search initiated at one of the MEDLARS search centers geographically dispersed throughout the United States and other parts of the world.

The new MEDLINE service promised to be far more effective and reach a larger number of users, and Louise Darling, then director of the Biomedical Library and Pacific Southwest Regional Medical Library (RML) Service at UCLA, and her colleagues in the region quickly realized that MEDLINE would be slow to develop if a training program did not exist on the west coast, due to the expense of sending library staff to the three-week training program that had been established at NLM. NLM accepted UCLA's proposal to establish a MEDLINE training center for the west coast, funded by NLM via the RML contract. The Pacific Southwest region included the state of Hawaii. Medical librarians in Hawaii also realized that if they were going to be early participants in the new and powerful MEDLINE database, a training program would need to be provided in Hawaii due to cost considerations. It would be far too expensive for librarians to travel to Los Angeles or Bethesda for the multi-week training program.

Initially, Hawaii was not on the schedule to receive the new MEDLINE service due to the high cost of traditional telecommunications between Hawaii and the US mainland. There was no Internet in those days, and the cost of MEDLINE via long-distance telephone calls from Honolulu was prohibitively expensive. However, there was the forerunner of the Internet, the Advanced Research Projects Agency Network (ARPANET). Developed by the Defense Advanced Research Projects Agency, the ARPANET was the world's first operational packet-switching network, developed for the US military. Through consultation between the Hawaii Medical Library, the US Army, the University of Hawaii, NLM, the National Bureau of Standards (NBS), and the UCLA Biomedical Library, a scheme was worked out to link Hawaii and NLM—a span of 6,000 miles—via 3 computer systems and a communications satellite sponsored by the Defense Department (Figure 1).

Once the telecommunications issues had been worked out, a class for Hawaii was scheduled for June 1973. Two trainers from UCLA, Angie Durso and J. Michael Homan, AHIP, FMLA, taught the first MEDLINE class for medical librarians in Hawaii and initiated MEDLINE service to health professionals in the islands and, by extension, to those in the Trust Territory and the Pacific Command of the US military (Figure 2). The MEDLINE training terminals (300 characters per second, thermal paper, acoustic couplers for the telephone lines) were set up on temporary tables in the basement of the Hawaii Medical Library, where they were linked via telephone line to the Aloha Telephone Company computer system at the University of Hawaii, which was linked to the communications satellite station over the Pacific Ocean. From Hawaii, the signal traveled to the Intelstat 4 satellite and then to the US ARPANET node in California at Stanford University. The signal then went via telephone line to the NBS computer in Washington, DC (NBS was an ARPANET node), and then by telephone line from NBS to the NLM computer. It worked! The only problem the class

Figure 1
1973 Hawaii MEDLINE class telecommunications configuration

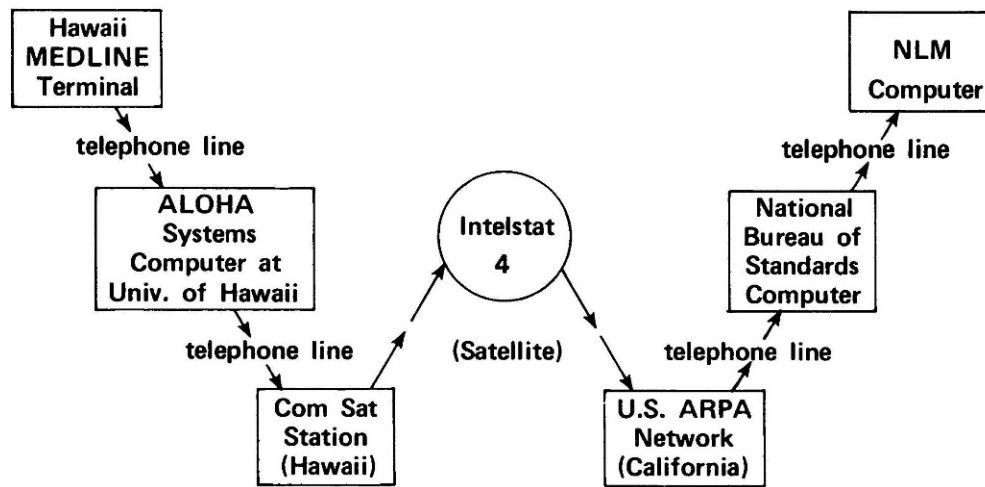


Figure 1 used with permission of the *Bulletin of the Medical Library Association*.

encountered was when NLM or NBS staff forgot to open the telephone line that linked NLM and NBS.

While it was critically important that the telecommunications system functioned efficiently, the real stars of the Hawaii MEDLINE class were the medical librarians who were committed to providing a new and improved service to health professionals in their region. The story of MEDLINE coming to Hawaii was memorialized in articles in the *Hawaii Medical Journal* [11] and the *Bulletin of the Medical Library Association* [12]. The headline above the article title in *Hawaii Medical Journal* was "Instant Medical References—Via Satellite!"

I have related the story about the first Hawaii MEDLINE class once before, in my 2000 inaugural speech as president of the Medical Library Association (MLA) [13] (Figure 3). I think the Hawaii MEDLINE story is worth repeating because it underscores our professional passion and our values, and it places technology in a subsidiary role—as a critically important tool to be sure—but not the reason we exist.

The 1970s online training at NLM and UCLA included extensive orientation to Medical Subject Headings (MeSH), indexing policy, and search formulation. With one database to cover in-depth and rudimentary search mechanics, extensive classroom time was spent on discussion to cover all areas in depth. The extensive time spent on MeSH and other topics plus extensive hands-on experience provided professional anchors for a generation of medical librarians and led to an era of extensive mediated services at both academic medical and hospital libraries. Significant publications on searching and search strategy appeared, and NLM established the short-lived Standing Committee for Online Retrieval Education (SCORE) to promote online education [14]. SCORE and MLA cosponsored a continuing education (CE) syllabus called "Online Search Optimiza-

tion," which was an outgrowth of SCORE activities and was an MLA CE course during the early 1980s [15].

The 1970s and 1980s were a particularly rewarding time for health sciences librarians. Grateful users could receive a quality literature search from a well-trained searcher in many different locations in much less time and with greater precision than with the old highly restricted MEDLARS service. Initial bottlenecks with MEDLARS searching had to do with serially run searches (batches), batch process technol-

Figure 2
1973 Hawaii MEDLINE class instructors Angie Durso and J. Michael Homan, AHIP, FMLA

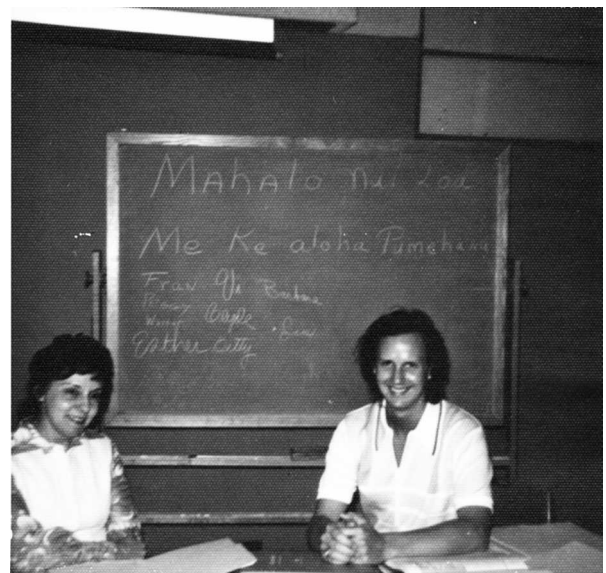


Image used with permission of Frances P. Smith, Arnold Library, Straub Clinic and Hospital, Honolulu, HI.

Figure 3

1973 Hawaii MEDLINE class participant Peggy Place and Instructor Homan



Image used with permission of Frances P. Smith, Arnold Library, Straub Clinic and Hospital, Honolulu, HI.

ogy, and complexity or perceived complexity of the search process. It was a very expensive operation requiring significant overhead at each search center. In the MEDLARS days, training to be a competent searcher at one of the relatively few MEDLARS search centers initially took a six-month residency at NLM. Users waited a minimum of three weeks to get the results of a request, and this was following any wait time in an institutional queue.

The initial MEDLINE classes in the early 1970s were also restricted due to technology. Initially, there was no computer time slicing when MEDLINE services first began at the MEDLARS search centers and Regional Medical Libraries. Every query to the NLM computer, no matter how complex, was fully executed before the next one was begun—just like the old MEDLARS batch process days. An example of this occurred during the first NLM MEDLINE training class in which I participated, when a class participant input a search that incorporated the entire MeSH “D” or drug category in relation to some other concept—a strategy often executed in MEDLARS batch searching. With no computer time slicing available, the entire NLM computer system ground to a halt while the computer executed that one query. Everyone in that initial MEDLINE class thought that the NLM computer had crashed.

Once reliable and relatively inexpensive telecommunications systems were in place and NLM’s ELHILL system employed time slicing, the restrictions on access to MEDLINE began to disappear. Eventually, training as the authorized path to access went away as well. It was only a matter of time until end users demanded full access to MEDLINE. There was really no other reasonable alternative, given the relatively small number of trained medical librarians in comparison to the huge volume of end users wanting direct access. Restricting access to a cadre of highly trained librarians was simply not sustainable, and it seems in retrospect only reasonable that NLM

would promote its new system to end users at the earliest possible time.

The era of the 1970s and 1980s was an extraordinary service-oriented era, which emphasized librarian-mediated services and included further developments in expert literature searching, end-user online training, and the ascendancy of commercial search systems such as BRS and Dialog.

1980s: specialized mediated services: embedded analysts at big pharma

My third professional picture relates to specialized mediated services of embedded analysts in a large multinational pharmaceutical company, the Upjohn Company in Kalamazoo, Michigan. This was an exciting time to be at a well-funded research library at a company (since acquired by Pfizer Pharmaceutical Company) with a history of strong support for its various libraries and information centers throughout the world and a great technology base and to be in an industry dependent on internal technical and published information for its competitive advancement and survival. Managing the process of discovering and indexing the company’s portfolio of published reports about its products and indexing and abstracting the company’s confidential technical reports were library responsibilities in addition to expert literature research, current literature alerting, end-user online training, and other standard research library services. High-speed links for library and end-user searching were established at BRS, and a sophisticated deduping system for multiple database searches was developed to support the library’s research services.

The library was a trusted collaborator of the research scientists, physicians, and administrative leaders but did not have a formal liaison program to the various drug development teams in the research enterprise, although many of the librarians had assumed informal liaison assignments for key customers of their services. At the suggestion of a library user who also happened to be a key member of a drug development team, the Upjohn research library initiated a project to embed librarians on selected drug development teams. The rationale was straightforward: If librarians regularly met with the members of the drug development team, they would become quite familiar with the research area and the internal and published literature about the area and would be able to offer far more informed and focused assistance, such as researching literature, facilitating access to needed documents, and building databases to help the team.

Library staff recognized that this would be very valuable to the drug development teams and would place library staff in a key position to use their expertise to benefit the team and company directly. Any new program has many issues, including, for some, an uncomfortable feeling of sitting with a new group when they perceive that their role should be in the library responding to literature search requests or

answering reference questions and not attending a team meeting.

The main problem and potential bottleneck was team selection. There were many teams in various stages of drug development, from initial filing of an investigative new drug application to late clinical trial stages, and there were a finite number of librarians available for team assignment. Identification of the drug development teams that would benefit most from a library team member became the issue. This was finally solved by targeting teams which had progressed to a specific point on the drug development continuum and had received significant competitive research funding from the company to move forward with their research area.

The acceptance of librarian drug development team members was not a leap of faith for the team, because many team members had regularly utilized librarian-mediated search services or might have attended end-user training classes to refine their personal searching skills. The teams appreciated librarian skill sets, including greater expertise and experience with searching and filtering. The combination of expert knowledge and provision of mediated services was thought to be highly beneficial to the success of the team. For the Upjohn research library, a direct link to the success of the drug development teams assisted by the library and, by extension, to the success of the company was established.

INFORMATIONISTS AND INFORMATION SPECIALISTS IN CONTEXT

The pharmaceutical research embedded analysts performed high-level mediated services, bringing evidence to bear on a team issue, often in a clinical context such as an ongoing clinical trial and in a basic research context. They were essentially operating as information specialists in context or informationists. It was not until 2000 that the notion of a new type of information professional in the health sciences, called an "informationist," first appeared in the article by Valerie Florance and Frank Davidoff in *Annals of Internal Medicine* [16]. The article spawned an informationist conference at NLM [17], an NLM informationist grant program (since discontinued) [18], and a growing body of literature that continues to explore the concept and document programs that have been established.

Embedded analysts require domain-specific research or clinical knowledge combined with institutional knowledge, but as with all information-based mediated information services, they require expert searching skills and highly specialized knowledge of databases and retrieval systems. Expert literature research skills are also the province of most hospital librarians, clinical medical librarians, and librarians who are attached to in-depth reference and expert searching departments at academic health centers. There is little difference in these programs in the requirement of expert literature searching and filtering skills.

DISCUSSION AND CONCLUSIONS

The science and art of linking information and knowledge to health care decision making by expert intermediaries, as well as the underlying technologies, are still evolving. Simon noted in 1997 that "a central lesson...of building information systems...is that people are constantly encountering exponential explosions of possible search paths and of information. Given the limits on human processing capabilities...it is clear that selectivity, not speed, is the name of the game" [8].

Librarians are expert at selecting, retrieving, and filtering. And, if intelligence is selectivity, they provide the intelligent systems, processes, and services that enable our institutions to thrive and succeed in an environment of information overload and dross.

In the context of keeping our eyes on the prize of exceptional patient care, promotion of patient safety, research competitiveness, and concern for individual and institutional success, let me offer a few concluding remarks drawn from my personal pictures of our profession over the last forty years.

■ It will be the responsibility of MLA and other like-minded professional groups to provide the intellectual and CE infrastructure to support the health sciences librarian as expert intermediary and knowledge coach. It will not or cannot be done by others, including NLM. The Task Force on Expert Searching policy statement in 2003 [19], the *MLA News* column on expert searching, the MLA CE course suites designated as EST and ISIC (for expert searcher training initiative and information specialist in context, respectively), new books on expert searching and Web 2.0 technologies, the thoughtful articles in the case study series of the *Journal of the Medical Library Association*, and other efforts are exciting to see unfold and are critical to the ongoing vitality and sense of identity of the profession.

■ As a profession, we have not satisfactorily solved the scalability and prioritization issues that come with highly personalized librarian-mediated services. In-depth reference services, clinical medical librarians, embedded analysts, and informationists contribute significant institutional value in multiple settings, including hospitals and academic health centers. But scaling these efforts to the economics and size of large teaching hospitals and academic health centers remains a challenge. Challenges also remain in selecting the most effective methodology to systematically identify and prioritize high-profile, institutionally important projects that are key to the success of the institution.

■ The knowledge coaches of the twenty-first century will continue to be highly valued if these positions promote both individual and institutional success in the context of patient care excellence, patient safety, research competitiveness, and conservation of that scarce and precious resource of time for decision making.

■ Reopening the discussion about certification by MLA for certain subspecialty areas of health sciences librarianship, such as ISIC and expert literature searching,

should be considered as these programs mature. Certification would bring additional rigor to such programs, allow greater alignment with library and information science schools, and promote readier acceptance of librarians in health care teams, particularly in the hospital environment. The more formal acknowledgement of expertise through certification may also assist in recognition by accrediting bodies such as the Joint Commission and Magnet recognition program.

■ The results of the MLA Research Section's 2008 survey, which attempted to discern the important and answerable research questions facing the profession, will serve the association well in the future. The research outcomes statements of the twelve core questions, culled from sixty-two questions received from section members and MLA leaders, often incorporate outcomes related to the success of institutions in the form of exceptional patient care and promotion of patient safety. The Vital Pathways for Hospital Librarians initiative of MLA should also be commended for effectively defining key roles and key outcomes in the context of institutional success [20].

Institutional ROI is increasing for librarian-mediated services that link knowledge and critical decision making in health care. MLA has played an important supporting role in the past and will continue to do so in the future to help the profession reach the highest standards of mediated librarian services to support exceptional patient care, transformative research, and the education of future generations of health care practitioners.

ACKNOWLEDGMENT

The 2009 Janet Doe Lecture is dedicated to someone who always kept his eyes on the prize, Daniel T. Richards. I met Daniel in 1971 at the UCLA Biomedical Library, where he had relocated as an employee at the conclusion of his NLM associate program. He was like an older brother to me, and I am sure he would have been sitting in the front row listening to the 2009 Doe lecture if fate had not intervened. Daniel died a few days after returning from our extended vacation trip to Europe in December 1995, which had been planned as a celebration of his fiftieth birthday.

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